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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,283	06/29/2004	Kazunari Domen	TAN-338	5205
35777	7590	03/09/2005	EXAMINER	
SHERMAN & SHALLOWAY 415 NORTH ALFRED STREET ALEXANDRIA, VA 22314				HAILEY, PATRICIA L
ART UNIT		PAPER NUMBER		
1755				

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/500,283	DOMEN ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Patricia L. Hailey	1755

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 25 August 2004.

2a)  This action is **FINAL**.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1-10 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5)  Claim(s) \_\_\_\_\_ is/are allowed.  
6)  Claim(s) 1-10 is/are rejected.  
7)  Claim(s) \_\_\_\_\_ is/are objected to.  
8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on 29 June 2004 is/are: a)  accepted or b)  objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date .

4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. .  
5)  Notice of Informal Patent Application (PTO-152)  
6)  Other: .

Applicants' Preliminary Amendments, filed on June 29, July 27, and August 25, 2004, have all been made of record and entered. In these amendments, both the Specification and claims have been amended to correct typographical errors. No claims have been canceled or added; claims 1-10 remain pending in this application.

***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicants' Priority Document was filed on June 29, 2004.

***Specification***

2. ***The disclosure is objected to because of the following informalities:***

In the Specification, the formula " $(\text{HH}_4)_2\text{TiF}_d\text{X}_{6-d}$ " and those like it are unclear. See, for example, page 5, lines 2-4 of Applicants' specification submitted on August 25, 2004, where reference is made to a titanium di-ammonium fluoride halide composition represented by the aforementioned formula. It appears that "HH<sub>4</sub>" should be "NH<sub>4</sub>".

Appropriate correction is required.

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is

requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

4. ***Claims 2-4 and 6-8 are objected to because of the following informalities:***

Claims 2, 4, 6, and 8 should be amended to recite the phrase “further comprising”, as opposed to the phrase “to which at least one promoter...is loaded”. This latter phrase suggests a process limitation, i.e., loading the photocatalyst with a promoter.

In claims 3 and 7, the word “anataze” should be “anatase”.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. ***Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.***

In claims 1-8, reference is made to a “titanium fluoride nitride” comprising “ $Ti(IV)O_aN_bF_c$ ”. In view of the limitations in, for example, claim 1, the subscript “a”

is never zero (0), indicating that oxygen is present in the “titanium fluoride nitride”. Thus, the phrase “titanium fluoride nitride” is not commensurate with the aforementioned formula.

Claims 9 and 10 are indefinite for the following reasons:

a. Neither claim 9 nor claim 10 clearly recites process steps defining the respectively claimed processes. For example, it appears that the process of claim 9 comprises the steps of baking titanium di-ammonium fluoride halide to form a starting material, nitrogenating the starting material by thermal synthesis in an ammonia atmosphere. However, it cannot be determined if these are actually the claimed process steps.

b. the formula “ $(HH_4)_2TiF_dX_{6-d}$ ” in both claims 9 and 10 is unclear.

Additionally, in claims 9 and 10, reference is made to a titanium di-ammonium fluoride halide composition represented by the aforementioned formula. It appears that, in this formula, “ $HH_4$ ” should be “ $NH_4$ ”.

c. The temperature ranges in claims 9 and 10 are missing degree symbols ( $^{\circ}$ ), as well as units of temperature. It cannot be determined whether these temperature ranges are in terms of degrees Celsius, Rankine, Kelvin, or Fahrenheit.

***Allowable Subject Matter***

7. Claims 9 and 10 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.
8. Claims 1-8 would be allowable if (1) rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, and (2) to overcome the claim objections set forth in this Office action, and where applicable, to include all of the limitations of the base claim and any intervening claims.
9. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not teach or suggest photocatalyst represented by the formulae recited in the instant claims.

***Information Disclosure Statement***

The references cited in the Search Report filed on June 29, 2004, have been considered, but will not be listed on any patent resulting from this application because they were not provided on a separate list in compliance with 37 CFR 1.98(a)(1). In order to have the references printed on such resulting patent, a separate listing, preferably on a PTO/SB/08A and 08B form, must be filed within the set period for reply to this Office action.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia L. Hailey whose telephone number is (571) 272-1369. The examiner can normally be reached on Mondays-Thursdays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Art Unit: 1755

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Patricia L. Hailey*

Patricia L. Hailey/plh  
Examiner, Art Unit 1755  
March 7, 2005

*J.A. LORENZO*  
J.A. LORENZO  
PRIMARY EXAMINER